Beneficial Use at Deer Island
A Decade of Design and Implementation

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Presentation Outline

- Deer Island Background
  - Location and History
  - Habitat and Structure
- Beneficial Use (BU)
  - History of BU Program & Law
  - State of Mississippi BU Master Plan
- Deer Island Marsh Restoration Project
  - Mississippi Department of Marine Resources (DMR)
  - U.S. Army Corps of Engineers (Corps)
  - Port of Gulfport (Port)
- Future of BU at Deer Island and in Mississippi

Location and History

- Harrison & Jackson County off the coast of Biloxi
- Remnant of nearshore area
- Native American population
- Europeans arrive early 1700s
- Farming and fishing communities established
- Last residents left in 1969 following Hurricane Camille
- Purchased by the State in 2003 as part of the Coastal and Estuarine Land Conservation Program

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Habitat and Structure

- Variety of habitats from sandy beaches to marshy interior
- Vast expanses of pine trees inhabited the island
- Habitat severely damaged by tropical storms
- Tree loss and lack of fires encouraged brush and shrubs to spread
- Decaying root structure provides an erosion pathway

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Deer Island Site Visit
Northern Shoreline

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Habitat and Structure

- Land loss estimated at 2 acres per year
- Island has decreased approximately 30% to 50% since the mid-1800s
- Eastern portion, "Little Deer," is not visible at low tide

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History of BU Program

- 2001 – Corps & DMR identify potential BU sites
- 2002 – DMR develops the *Long-Term Comprehensive Master Plan for Beneficial Uses of Dredged Material along Coastal Mississippi*
  - Deer Island identified as a pilot project for future BU sites
- 2008 – Beneficial Users Group (BUG) formed
  - State and federal agencies, co-facilitated by DMR and the Corps, Mobile District
  - Private stakeholders (e.g., local ports)
- 2010 – BUG recommends revised legislation
  - House Bill 1440 passed March 2010
  - Coastal Wetlands Protection Act § 49-27-61, effective July 1, 2010

2010 BU Law

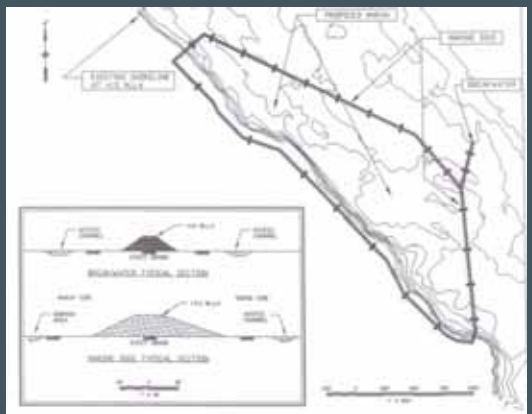
- Details
  - Requires BU for materials dredged from wetland areas of Mississippi
  - Applicable if over 2,500 cubic yards (cy) are removed for a project
  - Exemptions
    - Projects conducted by an exempt governmental agency
    - Projects conducted under governmental grant or bond proceeds
    - Projects that remove 2,500 cy or less from a permitted wetland area

2011 BU Master Plan Update

- Guided by the DMR and BUG
- Mississippi Coastal Improvements Program (MsCIP) study quantified sediment transport rates in the Mississippi Sound
- Provides potential BU sites and concepts
- Outlines permitting regulations (state and federal)
- Provides sediment testing protocols
  - Based on Corps and USEPA guidance
  - Simplified analytical, toxicity, and chemical testing
    - 10-day bioassay tests
    - Basic chemistry for metals, pesticides, and other COC's
- BUG initiates permitting actions for BU sites across the coast

Deer Island Marsh Creation Project DMR and Corps, 2002

- Eastern tip of Deer Island experiences high erosion rates
- Authorized under Section 204 of the Water Resources Development Act of 1992
- Concept designs Spring 2001
- Design completed Fall 2002
- Dike and coastal protection completed Spring 2003
- Marsh fill added Fall 2003



Source: Corps 2002

Deer Island Marsh Creation Project 2003

- Components:
  - 7-8 foot-high dike
  - Easterly wing dike
  - Flash board riser weirs
  - Offset to provide bayou
- Dredged material from Biloxi Lateral Channel
- Approximately 40 acres were filled with 365,000 cy of sediment


Post-Katrina
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Deer Island Restoration Project NOAA 2010

- Restoration in the northeast corner of the island
- Deployed to protect approximately 800 feet of shoreline
- Oyster bags for stabilization & habitat
- Promotes intertidal circulation

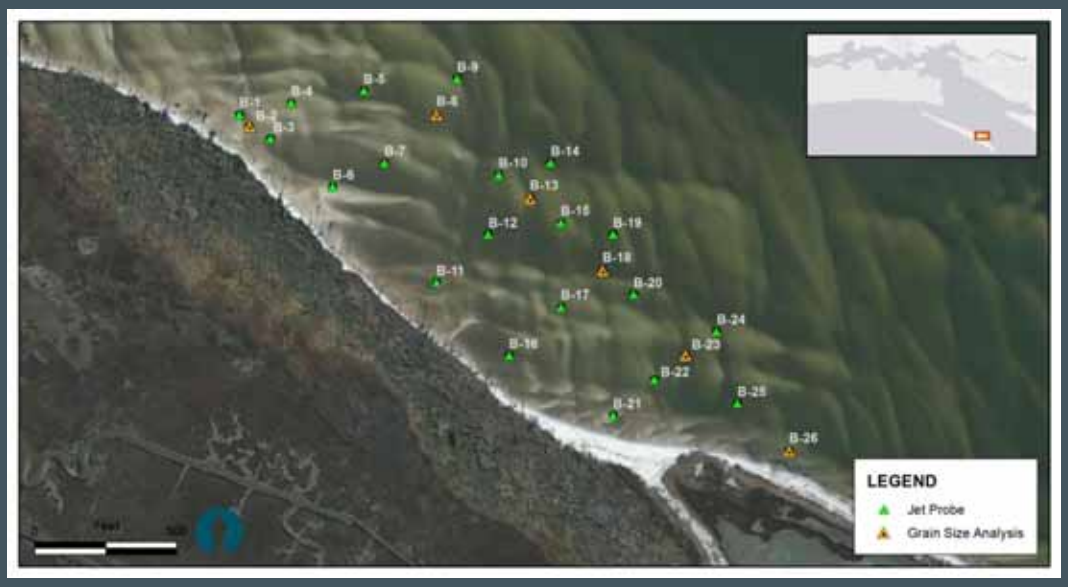
Deer Island and Port of Gulfport Restoration

Deer Island BU & Port of Gulfport 2012

- Design & permit assistance by Anchor QEA
- Approximately 350,000 cy of soft foundation material
- Materials tested using interim quality protocols
  - 4 composite samples collected
  - Bioassay results show no significant mortality
- Geotechnical Investigation at the Port & BU Site
  - 26 jet probes to interlace existing borings at Deer Island
  - 16 borings at the Port to quantify poor structural foundation materials and volumes

Sediment Test Locations Port of Gulfport

Geotechnical Testing Locations
Deer Island



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Deer Island BU & Port of Gulfport 2012

- Designed with DMR, Port, & Stakeholders
- Corps rebuilt existing cell under MsCIP
- Refill existing BU cell and construct additional expansion area BU cell
  - Open at the western end to encourage circulation and habitat development
  - Can be expanded for additional material
  - Mimics the historic 1850s footprint
  - Intertidal plant species
  - Chenier for nesting

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Deer Island Plan View

Deer Island Beneficial Use Port of Gulfport 2012

- Pump dredged material into the BU cells
- Construct mounds at various locations in the cell interior
- Placement method creates habitat diversity across the site
- Planned construction for this site is set for mid- to late-2012

Future Deer Island

- Restore 1850s footprint
  - Re-establish "Little Deer" to the east
  - Create > 7,500 feet of shoreline
  - 1.1 million cy in place needed for restoration
- Enhance habitats
- Dampen effects of coastal storms

Future of Mississippi BU Program

- *Project Management Plan*
  - Supplements the 2011 Master Plan
  - Adaptive management
  - Identifies sites and concepts for restoration
  - Provides SOP & streamlined process
- Re-developing marsh and nearshore habitats
- Keep Mississippi sediments in the system
- Guidelines to enhance and protect our coastal resources into the future

Questions?